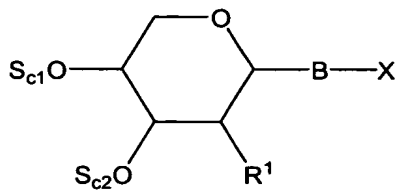
WE CLAIM:

1. A process for the preparation of a pentopyranosyl nucleotide containing nucleic acid comprising

(a) bonding a 3'-, 4'-protected nucleoside of the formula



to a solid phase,

wherein R^1 is selected from the group consisting of H, OH, phosphoramidite, Br, Cl, and an oligomer;

wherein S_{c1} is selected from the group consisting of H, acyl group, trityl group, allyloxycarbonyl group, phosphoester(III), phosphoester(V), thiophosphate(V), phosphonate, and phosphoramidite;

wherein S_{c2} is selected from the group consisting of H, acyl group, trityl group, allyloxycarbonyl group, phosphoester(III), phosphoester(V), thiophosphate(V), phosphonate, phosphoramidite, and an oligomer;

wherein B is a nucleobase selected from the group consisting of purine, 2,6-diaminopurine, 6-purinethiol, pyridine, pyrimidine, adenine, guanine, isoguanine, 6-thioguanine, xanthine, hypoxanthine, thymine, cytosine, isocytosine, indole, tryptamine, N-phthaloyltryptamine, uracil, caffeine, theobromine, theophylline, benzotriazole, and acridine; and

wherein X is an H or a linker of the formula $-(CH_2)_n-Y$, wherein Y is a protected or deprotected nucleophile or electrophile;

(b) reacting the 3'-, 4'-protected nucleoside bonded to a solid phase according to step (a) with a phosphitylated 3'-, 4'-protected nucleoside of the same formula in step (a), after deprotecting the 4' position of the nucleoside bonded to the solid phase;

(c) oxidizing the coupled product from step (b); and

(d) repeating steps (b) and (c) using nucleosides or linker nucleosides until the desired nucleic acid is produced, wherein the nucleic acid contains at least one linker of the formula $-(CH_2)_n-Y$.